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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/617,552	07/10/2003	Hsin-Pang Wang	133979-1	4302

7590 06/17/2004  
General Electric Company  
CRD Patent Docket Rm 4A59  
Bldg. K-1  
P.O. Box 8  
Schenectady, NY 12301

EXAMINER

LIN, ING HOUR

ART UNIT PAPER NUMBER

1725

DATE MAILED: 06/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/617,552

Applicant(s)

WANG ET AL.

Examiner

Ing-Hour Lin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 10 July 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-32 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 0608

- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

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## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 25-26 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In claim 25, the claimed features in lines 1-2 are unclear because there is a lack of configuring step for forming the core with the internal passages. Further, the claimed step lacks support in the specification.

### *Claim Rejections - 35 USC § 102*

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 29-32 are rejected under 35 U.S.C. 102(b) as being anticipated by Whalen et al.

Whalen et al (col. 4, EXAMPLE 1, lines 15+) teach the claimed die (a RP mold in Fig. 3) for making a casting core (ceramic turbine blade), comprising a single piece structure comprising at least one cavity (see Figs. 1-2), wherein the said structure comprises a material including epoxy or silicone (fugitive polymer (col. 3, lines 24+) and

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can be selectively removed from the core by heating or chemical dissolution; and the structure is assembled in additive layers (slices) by stereolithographic process.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 1-3, 5-20, 22-24 and 27-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Woodrum et al in view of Whalen et al.

Woodrum et al (col. 2, lines 31+) teach the claimed method for investment casting a component including one of a vane and a blade in a turbine assembly, comprising making a multi-wall ceramic core, wherein a fugitive pattern (col. 2, lines 59+) is assembled in additive layers (slices) by lithographic process having multiple thin wall pattern elements providing internal wall-forming spaces of a final core for forming space-

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apart relationship with external investment wall in order to form internal cooling passage including turbulators (col. 3, lines 13+), the pattern is placed in a core molding die cavity having a core configuration, an alumina based ceramic slurry is injected molded into the die cavity about the pattern and the between the pattern elements to form a ceramic core, and the core is removed from the core to provide a multi-wall green core. The green core then is fired or cured to develop core strength for casting and used to form an investment mold for casting an airfoil.

Woodrum et al fail to teach the use of a single piece sacrificial die. However, Whalen et al (col. 4, EXAMPLE 1, lines 15+) teach the claimed die (a RP mold in Fig. 3) comprising at least one cavity (see Figs. 1-2) for the purpose of effectively molding a ceramic core, wherein the said structure comprises a material including epoxy or silicone (fugitive polymer (col. 3, lines 24+) and can be selectively removed from molding a ceramic core by heating or chemical dissolution and the die is assembled in additive layers (slices) by lithographic process.

It would have been obvious to one having ordinary skill in the art to provide Woodrum et al the use of a single piece sacrificial die as taught by Whalen et al in order to of effectively molding a ceramic core.

8. Claims 4 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Woodrum et al in view of Whalen et al and further in view of Zoia et al.

Woodrum et al in view of Whalen et al fails to teach the use of laser sintering or laser deposition. However, Zoia et al (col. 4, lines 66+) teach the use of laser sintering or laser deposition for the purpose of effectively adding layers with high strength in making

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the single piece sacrificial die. It would have been obvious to one having ordinary skill in the art to provide Woodrum et al in view of Whalen et al laser sintering or laser deposition as taught by Zoia et al in order to add layers with high strength in making the single piece sacrificial die.

9. Claims 25-26 insofar as definite are rejected under 35 U.S.C. 103(a) as being unpatentable over Woodrum et al in view of Whalen et al and further in view of Hastilow.

Woodrum et al in view of Whalen et al fail to teach the use of a single die for forming a core having a configured internal cooling passage. However, Hastilow (col. 3, lines 56+) teaches teach the use of viewing aperture or slots defined in a CAD data file and providing the CAD data file into a sterolithography machine for the purpose of effectively producing internal cooling passage in an investment cast airfoil. It would have been obvious to one having ordinary skill in the art to provide Woodrum et al in view of Whalen et al a sterolithography machine having the CAD data file for forming the single die and producing a core having a configured internal cooling passage as taught by Zoia et al in order to effectively produce an internal cooling passage in an investment cast airfoil.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ing-Hour Lin whose telephone number is (571) 272-1180. The examiner can normally be reached on M-F (8:00-5:30) Second Friday Off.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Dunn can be reached on (571) 272-1171. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0651.

*f. H. L.*

I.-H.L

06-08-04



TOM DUNN  
SUPERVISORY PATENT EXAMINER  
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